

APPARATUS FOR IMPRINTING LITHOGRAPHY AND FABRICATION  
THEREOF

ABSTRACT OF THE DISCLOSURE

An imprinting apparatus and method of fabrication provide a mold having a  
5 pattern for imprinting. The apparatus includes a semiconductor substrate polished in  
a [110] direction. The semiconductor substrate has a (110) horizontal planar surface  
and vertical sidewalls of a wet chemical etched trench. The sidewalls are aligned with  
and therefore are (111) vertical lattice planes of the semiconductor substrate. The  
semiconductor substrate includes a plurality of vertical structures between the  
10 sidewalls, wherein the vertical structures may be nano-scale spaced apart. The  
method includes wet etching a trench with spaced apart (111) vertical sidewalls in an  
exposed portion of the (110) horizontal surface of the semiconductor substrate along  
(111) vertical lattice planes. A chemical etching solution is used that etches the (111)  
vertical lattice planes slower than the (110) horizontal lattice plane. The method  
15 further includes forming the imprinting mold.